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ABSTRACT

With an increasing number of women becoming members of flight crews, the leadership styles of men and women are at issue. A study explored three basic questions: (1) How do male and female learning and leadership styles differ? (2) What barriers to gender integration and crew teamwork are perceived by pilot crew members? and (3) What recommendations can be made to support improved Crew Resource Management (CRM) training programs? A review of the literature revealed three important areas of research: women's learning styles, women's leadership characteristics, and recent research in CRM. The literature showed that men prefer debate-like learning situations, whereas women like to share and learn by interacting in a collegial manner. As leaders, women are often perceived as acting inappropriately if they put their professions first, or if they do not offer emotional support, according to the literature. The literature also found that women are better at communicating a skill that should be stressed in CRM programs. The study methodology included 19 interviews with airline, military, and corporate pilots of both genders in order to determine their perceptions concerning the research questions addressed in the study. After the interviews, three observations were made of CRM training sessions, using various male-female configurations of the training groups. Results of the interviews showed that women were reported to have different styles and that they suffered as crew members because of lack of understanding of gender differences on the part of both women and men and because of the "macho" pilot image. Based on the information that emerged from the study, there is a need to provide training for crew members regarding differences between men and women in learning and leadership styles. Suggestions were made for changes in CRM instructional design. (Contains 24 references.) (KC)

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UNIVERSITY AVIATION ASSOCIATION

FALL CONFERENCE

Women's Learning and Leadership Styles: Impact on Crew Resource Management

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OCTOBER 7, 1994
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INTRODUCTION

It has been more than a decade since Texas International, United Airlines and KLM began classroom programs to address Crew Resource Management (CRM) issues (Charles, 1991). Early CRM training was generally narrow in scope and focused primarily on the role of the Captain. Current CRM has broadened to include the flight crew and the aircraft crew. The development of interpersonal skills and communication is the challenge of the next generation of CRM training.

The Problem

Flight crews have traditionally been predominately male and hierarchical in nature. The ideal pilot image portrays a dominant male figure with "the right stuff." (Nagel & Wiener, 1988). There are those who believe that doing the job in the cockpit does not include interpersonal skills. However, the paradigm has shifted in aviation. In today's cockpit, job performance means having effective interpersonal skills. At present, "the world's 2000 or so women transport cockpit crewmembers are helping to erase the perception that aviation is a 'man's world.'" (Gilmartin, 1992, p.62).

Concepts regarding command, leadership, communication style, decision-making and shared authority have different meaning for women and men. In order to promote the functional effectiveness of every member of the crew team, learning and leadership styles that do not conform to the past paradigms must be addressed. These issues must be addressed in order to create better CRM programs which include gender-related differences.

Research Questions

This study explored three basic questions: (1) how do male and female learning and leadership styles differ? (2) what barriers to gender integration and crew teamwork are perceived by pilot crew members? (3) what recommendations can be made to support improved CRM training programs?

LITERATURE SURVEY

A review of the literature reveals three important areas of research, namely women's learning styles, women's leadership characteristics and recent research in CRM.

Women's Learning Styles

Women do not learn as men do. Tannen (1990) states that men prefer debate-like situations in which they pursue knowledge by ritual opposition, while women like to share and learn by interacting in a collegial manner. According to Gilligan (1982) authoritative systems are more important to men in defining relationships than to women and Belenky et al (1986) contend that women value affiliation and acceptance more then do men. Females tend to be more participatory in their learning styles and males are more independent(Emanuel and Potter, 1992).

Gilligan differentiates men's and women's thinking with the metaphors of the web and the ladder. Women operate in a web, suggesting interconnectedness and relationship-building; men operate on a ladder, suggesting achievement orientation and hierarchical thinking (Bannister, 1990).

Women's Leadership

Women, according to Simeone (1987), are channeled by societal tradition and custom into roles which are less directive and more supportive. Women tend to look outside themselves for verification of achievement.

Another issue which affects women's leadership is the problem of role anomalies. Women are often first identified by sex rather than by career role. Thus, men dealing with women leaders are uncomfortable when women don't behave in stereotypical roles, such as providing emotional support. Role anomalies cause confusion and misunderstanding. Another difficulty lies in the perception that women are primarily responsible for family care. These kinds of assumptions generate doubts about women's professional commitments. Also, if women appear to put their work first, they are somehow considered to be inappropriate.

Closely related to sexual role anomalies is the issue of sexual harassment. Professional meetings often include jokes or comments about women as sex objects. Women have not been prepared to confront these issues clearly and directly, which they must do in leadership roles.

Communication has different meaning for males and females. Sociolinguistic studies, according to Weiss (1993), reveal actual gender differences in language, including vocabulary, intonation and sentence structure. Male language is direct and female language contains greater imagery. "Women use intensifiers (e.g. so, such, quite, very, etc.), modifiers, tag question (e.g. isn't it?), and mild expletives. There is a general notion of uncertainty or hesitancy in female speech. Male language is more absolute; female language more abstract and emotional. Men tend to dominate conversation and dispel their knowledge and expertise, viewing life as a hierarchy where they are in competition. Women see themselves as part of a community network, desirous of closeness, intimacy and consensus." (p.57).

Men work best with numbers and logic and females benefit from situations that are people-oriented and ones in which they can set goals and use feedback to modify procedures. Sally Helgesen (1992) states that nurture and support empower people to reach their full potential while competition surpresses creativity and innovation.

Wasserman (1986) observes that women with personal power, operating in chiefly male territory, are forces to be reckoned with. However, states Weiss (1993), "assumptions about masculinity and femininity, characterizing the male as sexually dominant, unemotional, confident, authoritative and strong and the female as vulnerable, weak, emotional, passive and dependent pervade Western culture." (p.56)

CRM Research

In referring to the "human factors" currently recognized as the leading cause of aviation accidents, Charles (1991) states rather dramatically that "we are killing people and crumbling aluminum because of poor communication and lack of basic people management skills." (Michael, 1991).

"The flight of a sophisticated multipilot transport aircraft is a highly structured group performance situation where a number of interpersonal factors are relevant to crew effectiveness," state Foushee and Helmreich as a result of their research in CRM. (Nagel and Wiener, 1988, p. 192) Yet, they report, so much emphasis has been placed on machismo and bravery that we may

be selecting individuals as pilots who communicate less than the average person. Even today Federal Aviation Regulations emphasize individual pilot proficiency. Yet, a highly complex operational environment requires highly coordinated team performance. A number of training techniques have been used to heighten awareness. Still, "it is felt that the pilot socialization process has not generally produced patterns consistent with teamwork."(Nagel and Wiener, p.220) This is possibly because "the open treatment of issues related to one's interpersonal competence can be very anxiety provoking. . " (Nagel and Wiener, pp. 220-223)

Machado (1994) states that women are better at communication. He agrees with Tannen that women are more inclined to "negotiate" in their communication style in contrast to men's tendency to be "matter-of-fact." (Machado, 1994) Men speak to both exchange information and establish status in a group; women talk to exchange information and establish cohesion. Summary of Literature Survey

The literature clearly states that women and men exhibit differences in their styles of learning. Men are more competitive and women are more collaborative. Women's ability to share power and establish consensus offers a natural advantage as an effective crew member in today's sophisticated aircraft. Women continue to struggle with leadership roles particularly when other crew members expect and require behavior that is associated with males alone. The machismo traditions of the aircraft cockpit create special training challenges for CRM programs that expect to address the learning and leadership requirements of the emerging female professional pilot.

RESEARCH DESIGN

The methodology of the study included nineteen interviews with airline, military and corporate pilots of both genders in order to determine their perceptions concerning the research questions addressed in the study. A committee, consisting of two airline pilots (one male and one female) and a researcher in women's leadership styles validated the data, conclusions and recommendations.

After the completion of the interview process, three observations were made of Crew Resource Management training sessions. The first group included one female and two males. All were military members of a C-5A cockpit crew. The second and third groups observed were airline crew members. Although the groups contained both males and females, all cockpit crew members of the third group were male.

Definition of Terms

One concept that needed further definition was the concept of crew resource management. In the context of this study, CRM refers only to pilots, including Captain, First Officer, and Flight Engineer. There exists a second and broader definition of CRM which would include the cabin crew, baggage personnel, maintenance crew or others who support a flight.

Second, a variety of terminology was used to identify CRM programs. It included Flight Operations Resource Management (FORM), Flight Deck Management (FDM), Aircrew Resource Management (ARM), Aircrew Coordination Training (ACT), Flight Team Management (FTM) and Command, Leadership Resources (CLR).

Third, the concept of Line Oriented Flight Training (LOFT) refers to pilot flight crews training through realistic simulations of actual flight situations in which irregularities occur. The training is done in highly sophisticated three-axes simulators which perform almost exactly as actual aircraft.

Limitations

This study contains a number of limitations. It does not address learning and leadership in the all-male or in the all-female crew. Second, the selection of individuals interviewed, although it represented airline, military and corporate pilots, was not large enough to provide trend data. The same was true of the CRM observations. Third, the study did not address differences which may be relevant to the number of individuals who make up the pilot crew, nor did it concern itself with national, ethnic or cultural differences.

RESULTS

Literature Survey

The literature survey revealed that researchers have found a number of differences between men and women in learning and leadership styles. Men have been found to prefer competition and opposition, while women prefer cooperation and collaboration. Women build relationships; men focus on achievements. Men work best with numbers and logic and women are people-oriented and process-oriented. Male language is more direct than female language. Women are more participatory in leadership style while men are more autonomous. Women are more sensitive to others' feelings; men are more independent of others. Women view themselves as part of a community network.

With regard to CRM, the literature revealed two issues relevant to female crew integration. The first one is the "macho" image of the pilot which prevails in the aviation industry. The second is the importance which males ascribe to status and the appearance of who is in control in the cockpit situation.

Interview Data Results

A number of themes regarding learning and leadership styles emerged from the interview data.

- Men and women were reported to have different leadership styles.
- Men were reported to be more task oriented and to exhibit more confidence as members of a crew.
- Women were reported to be better communicators, to exhibit more sensitivity to people and to be good negotiators.
- Women were reported to work harder at learning technical information to compensate for a possible lack of background in mechanical training.

Barriers to women's integration in the crew team were reported by both males and females:

- Lack of understanding of gender differences
- "Macho" pilot image
- Males perceived as the leaders
- Stress on females to continually earn the respect of their male peers. Both males and females agreed that mistakes made by women become generalized and are perceived as gender weaknesses.
- Small number of female pilots-in-command
- Male beliefs that females have logged fewer flight hours
- Males who don't view female crew members as professionals. (taking care of women or making sexual advances)

- Language choices by both males and females

With regard to factors that improve crew teamwork, the following themes emerged:

- Males and females reported that better teamwork emerges from better communication.
- Males and females agreed that all crew members should "do the job."
- Better situational awareness and the ability to listen and evaluate were considered by males to be important ingredients to cockpit teamwork.
- Females agreed that shared decision-making, conflict resolution and patience were factors which improve crew teamwork.
- Females believed they should behave in a confident manner, particularly toward males.
- Males reported favorable reactions to self-critiques of behavior in cockpit simulation situations

Additional Information from Interviews

From the interview data collected some additional information emerged. For example, one-quarter of the pilots interviewed said that they didn't believe there was a difference in learning styles between men and women. There were concerns about quota hiring practices and unequal treatment. The issue of pregnant female pilots' being excluded from the cockpit emerged. A female airline pilot reported that although the job requires assertiveness, men see that trait in females as aggression. Several pilots reported that in spite of CRM training, the Captain of the aircraft usually makes all decisions unilaterally. One male reported that it is time for women to learn how men see things differently.

CRM Observation Data

During the group discussion period following the observation of the military flight crew, the question of individuals yelling at one another was introduced by the female officer. Although she later indicated to the observer that the issue was one of basic respect, neither the CRM instructor nor the male crew members were able to identify the issue; in fact, the question of respect was never addressed.

The behavior patterns in the airline crew observations were characterized by reticence and formality. The observer noticed that the males in both groups were willing to engage in discussion with the male instructors, while the females remained silent. The second airline CRM training session generated almost no discussion involving either gender. The females, when questioned afterward, indicated that they perceived no real communication taking place in the CRM sessions.

DISCUSSION

The results of the study include the identification of a body of research which clearly demonstrates differences between males and females in learning and leadership styles. Yet, several individuals interviewed stated that they did not perceive differences in learning styles. This may be due to the sample size or lack of awareness of the emerging research regarding women's learning.

Pilots interviewed, however, unanimously expressed awareness of differences between men and women in leadership styles. Generally, women were deemed to function more successfully than men in leadership areas such as communications skills and interpersonal relationships.

The following statements are indicative:

- Women are more sensitive to others' feelings and have compassion.
- Women try to empower others to do the job.
- Women are more subtle, less domineering.
- Women are more adept at addressing issues and talking things out.
- Women are better negotiators.
- Communication is easier for women.

However, It was further observed by both sexes that women should strengthen their abilities to demonstrate confidence and forcefulness.

- Men are more direct; they give orders.
- Men are assumed to be the leaders by virtue of gender.
- A pilot needs to be an aggressive type - independent and self-reliant.
- The best women pilots are not feminine; they have masculine qualities.

Both females and males stressed the desirability of demonstrating confidence; however, a problematic area of misunderstanding and conflict arose when women were perceived to act in a manner that was ascribed to men. This included assertive behavior, strong language and a forceful demeanor. Areas of conflict are the issues of quota hiring, pregnancy, and attitudes that associate males with leadership roles.

IMPLICATIONS FOR CRM

Based on the information which emerged from the study, there is a need to provide training for crew members regarding differences between men and women in learning and

leadership styles. Lack of understanding of these differences inhibits communication and continues to cause gender-related bias.

Some of the issues and attitudes revealed in the study cause blockages to effective crew teamwork. For example, people are perceived as strong and more confident when they are assertive. However, forceful behavior and language is considered masculine. Therefore, women, who exhibit this behavior are considered by some men to be inappropriate.

Women and men agreed that all individuals should be regarded as professionals first. However, both men and women continue to experience situations in which they are demeaned in their sexual identities.

Important Issues Which Emerged

The following important issues emerged from this study:

(1) cockpit crew effectiveness may be significantly reduced due to lack of crew insight regarding the ways in which men and women learn and exert leadership differently.

(2) CRM training should include instructional designs that target the increasingly diversified crew population.

In a cockpit where the focus ought to be on cooperation, not competition and where decision-making is based on developing agreement, the full participation of EVERY member of the crew is essential to increased situational awareness and reduced risk of calamity. To the extent that CRM training can address the "styles", characteristics and attitudes of a diverse population, it will fulfill its purpose.

The results of this study imply both real and potential conflicts within pilot crews; they imply attitudinal and behavioral barriers; they imply issues which have legal ramifications; and finally they imply the need for serious re-evaluation of CRM strategies.

RECOMMENDATIONS FOR CRM INSTRUCTIONAL DESIGN

Instructional Design Reassessment - is needed to identify problems that may be related to gender differences.

Focus Groups - CRM training programs should include a component in which crew members are offered incentives to participate in groups which study current research regarding differences in learning and leadership styles. These groups can be loosely organized and facilitated by periodic meetings and electronic communication.

External Assessment - CRM training programs should be periodically assessed by an external evaluator regarding the appropriateness of material included in training.

Discussion Groups - Frank discussion during recurrency training should be provided for pilot crews. These sessions should be facilitated by an individual with expertise in group process. Of greatest importance is informality, anonymity and freedom from employer penalty.

Crew Surveys - should be conducted periodically to identify sensitive issues and developing interpersonal concerns.

Leadership Training Workshops should be offered to pilot crews. Research reveals that the kind of leadership skills required in today's aviation environment are very different from the skills required just a decade ago.

Check Pilot and Instructor Training Sessions Instructors are key personnel in supporting an effective CRM program. These individuals should receive very careful training in current research regarding gender and multicultural issues. Bell (1992) found that training for instructor personnel should include awareness of small inequities that may have a cumulative effect. Instructors, for example, must consciously encourage both males and females to succeed; they must elicit responses equally; they must be conscious of attitudes, tone of voice and choice of language. They should dispel stereotypes and select anecdotal material with which both females and males can relate. Expertise in interpersonal relationships has become as crucial as recurrent training on aircraft systems.

De-briefing Sessions offer pilots excellent opportunity at the completion of a flight to expand their communication skills. Practice in positive critiquing is essential if de-briefing is to be effective. Critiquing skills, however, must be taught before they can be practiced successfully.

Crew Involvement in CRM training is a significant component. Opportunities for pilots to engage in self-critique and analysis in conjunction with LOFT training were reported as useful by two pilots interviewed.

Peer Led Workshops provide opportunity for crew involvement in CRM training. are another form of crew involvement. If individual pilots or voluntary teams were encouraged to offer workshops for their peers, it would provide an opportunity for each gender to share assets. In addition, direct participation by individuals affected by the CRM training would provide ownership and pertinent updating. CRM programs would become more flexible and focused on current needs. Furthermore, the process itself breaks down barriers.

Rewards and Incentives for participation and development of activities that improve CRM is a strong asset to a training program which is committed to involving those who are most affected in the training process itself. The enthusiasm with which the pilots interviewed in this study responded to questions about interpersonal factors pilots is an indication of the level of willingness to be involved.

Role-modeling is a key factor in any student's learning process. Female instructors should teach technical and operational training sessions at all levels.

Simulation exercises in which authority is used to delegate responsibility would permit more traditional crew personnel to experiment with a new paradigm in shared decision making without threatening the autonomy of any individual. In a cockpit where the focus is on cooperation, not competition and where decision-making is based on achieving agreement, shared authority and full acceptance of responsibility by each crew member is possible.

We cannot afford, says Antler (1990), to let the different ways of seeing remain isolated from one another. We each have much to learn from the way our counterparts approach the world. The same energy that goes into aircraft systems training ought to go into carefully developing all the interpersonal skills that make successful teamwork. Human systems, in fact, are truly much more complex than mechanical systems.- a reality which we cannot afford to neglect if we are to prevent even a single aircraft tragedy.

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APPENDIX A

LEARNING AND LEADERSHIP STYLE DIFFERENCES

FEMALES	MALES
COOPERATIVE	COMPETITIVE
COLLABORATIVE	INDEPENDENT
RELATIONSHIP FOCUS	ACHIEVEMENT FOCUS
PEOPLE ORIENTATION	LOGICAL ORIENTATION
SUBTLE LANGUAGE	DIRECT LANGUAGE
PARTICIPATIVE	AUTONOMOUS

GENDER STRENGTHS

FEMALES	MALES
COMMUNICATORS	**TASK ORIENTED**
NEGOTIATORS	**FOCUSED**
SENSITIVE	**CONFIDENT**

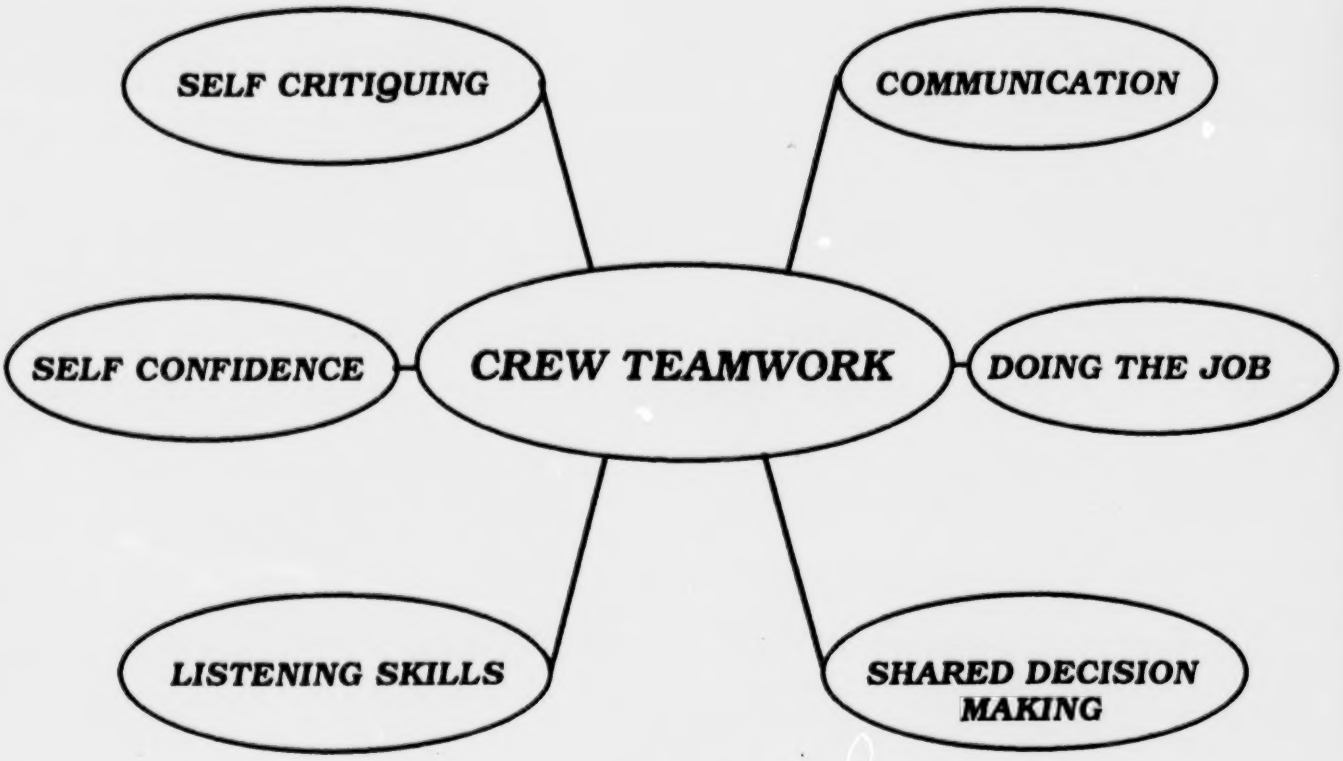
APPENDIX B

BARRIERS TO FEMALE INTEGRATION IN THE COCKPIT CREW

- LACK OF UNDERSTANDING OF GENDER ISSUES
- "MACHO" PILOT IMAGE
- STRESS ON FEMALES TO EARN RESPECT
- PERCEPTION THAT MALES ARE THE LEADERS
- NON-PROFESSIONAL TREATMENT OF WOMEN
- DEMEANING LANGUAGE
- PREGNANCY
- FEMALE ASSERTIVENESS

APPENDIX C

FACTORS THAT FACILITATE CREW TEAMWORK



APPENDIX D

RECOMMENDATIONS FOR ADDRESSING GENDER AND IMPROVING CRM TRAINING:

1. INSTRUCTIONAL DESIGN ASSESSMENT
2. FOCUS GROUPS
3. EXTERNAL ASSESSMENT
4. INTERACTIVE DISCUSSION GROUPS
5. CREW SURVEYS
6. LEADERSHIP TRAINING
7. CHECK AIRMEN/ INSTRUCTOR TRAINING
8. DE-BRIEFING SESSIONS
9. PEER-LED WORKSHOPS
10. TEAM REWARDS AND INCENTIVES
11. ROLE-MODELING
12. SIMULATION

APPENDIX E

RESEARCH INTERVIEW GUIDE

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OBJECTIVE OF INTERVIEW: To identify: (1) any differences in women's learning and leadership styles in the cockpit, (2) barriers to the integration of women in the cockpit crew and (3) behaviors which result in better cockpit teamwork.

PLEASE IDENTIFY YOURSELF AS:

_____male _____female

_____airline pilot _____corporate pilot

_____military pilot

1. Do you think that women's learning styles are different from those of men? If so, can you give examples from your experience?

2. Are women's leadership styles different from those of men? If so, can you give examples from your experience?

3. Do you think there are any barriers to women's integration as effective members of a cockpit team? If so, what are they?

4. What behaviors in your experience build better cockpit teamwork?